# ADDRESSES BY CITIZENS TO SCHOOL BOYS

Various citizens of Winnipeg have made addresses before the public-school boys. These addresses have been printed in pamphlet form by the Winnipeg Industrial Bureau. That Bureau gave permission to the *Elementary School Teacher* to print several of the addresses as examples of what can be done in the way of bringing industrial information into the schools. There is no community where similar addresses are not possible.

## APPRENTICESHIP

E. E. E. BAILEY
Supervisor of Apprentices, Canadian Pacific Railway Shops, Winnipeg

This afternoon I have been asked to talk to you, boys, on the way to become an apprentice. Several papers were read to you last season on the choice of a trade and how to commence and follow it, and I want now to go a little farther and tell you of the steps necessary to be taken, once you have decided on the trade to follow, should you wish to be apprenticed with us at Weston.

But first I want to point out, as so many gentlemen did in their addresses in the early part of the year, how very necessary it is that you should not suddenly drop, at the age of twelve or fourteen, all schooling. You will see why in a moment.

We have thirteen distinct and separate trades for you to choose from, namely, machinist, electrical machinist, boiler-maker, blacksmith, molder, pipe-fitter, airbrake-fitter, brass-finisher, pattern-maker, tinsmith, painter, tool-maker, and coach-carpenter, so you see there is plenty of choice.

But we expect a boy, once he has selected the trade he thinks he would like to follow, and has been duly apprenticed to it, to stick to it and not to switch round and tell us he does not like what he has chosen and that he wants to change to something else.

However, telling you that now, is rather like putting the cart before the horse, and you will want to know what to do first.

First, then, when you apply at the shops, you will have to pass an entrance examination in simple arithmetic, such as sums in fractions and decimals, freehand drawing, and English composition, because we are going to teach you more than that before we turn you out a tradesman, and we have not time to instruct you in all primary subjects.

Now, it is just here where so many applicants fail (and if you don't pass the examination you don't get made an apprentice), and that is why I said, at the beginning, it was so necessary to keep up, at any rate in some degree, the schooling that many boys leave behind them for a couple of years. Many boys come along thinking it easy enough to remember what they learned three or four years back, and are surprised when they get stuck with what used to be simple sums. That is where the advantage of keeping up your schooling comes in, for it is only by constant practice that you can keep your mind trained to acquire and retain knowledge.

It does not follow, in fact it very rarely happens, that there is an immediate vacancy for an apprentice in any of the trades, even if he is successful in passing the entrance examination. We have so many boys anxious to serve their time with the company that a waiting list is kept for each trade, and boys enter in rotation as vacancies occur. So it is better for a boy to present himself some months before he is sixteen (which is the minimum age at which apprenticeships are started), in order that he will be able to complete the obligatory five years at the time, or soon after, he is twenty-one.

Next, supposing the vacancy occurs. The senior boy on the list is written to, generally about a fortnight beforehand (so that, if he is in a job he can give convenient notice), and instructed to obtain a medical certificate of suitability from the company's doctor—and, I may say, that no boy is accepted who is a cigarette smoker. Armed with this, and accompanied by his parent or guardian, he comes up to the shops, and, provided the certificate is satisfactory, he is duly indentured or apprenticed. These indentures are simple documents, consisting practically of two

clauses, one that he shall serve an apprenticeship of five years, and the other that he shall not become a member of a trades union until he is out of his time, when he can please himself.

All these preliminary things being settled, the boy is now fairly launched into the way of learning his trade. The training in every department is very careful and thorough and, beyond his shop work, each boy in his first year takes up for two hours a week, in the company's time, his arithmetic where he left off at school, and one or two other elementary subjects, such as freehand drawing. The next two years he is given more extended technical instruction for four hours per week, and each year the company donates scholarships to the five boys gaining the highest marks in the annual examinations on the year's work. These scholarships consist of some technical course chosen by the successful boy as most useful in increasing his theoretical knowledge of the trade he is learning, and a special class is held each week for them.

Now, there are only one or two things the company expects from an apprentice in return for the care, time, and trouble that is expended on him. First, he must be punctual, and, second, he must apply himself to his work and seek to learn all he can. Idleness is not allowed, nor is inattention or incivility. As regards punctuality, he is allowed two "lates" in a month, with a maximum of twelve a year, and he may have one hundred hours off per annum without affecting his annual increase. Anything over this number he has to make up before he can obtain an increase in pay.

The rates of wages during apprenticeship are the same for all trades and run as follows: first year, 13 cents per hour; second year, 17 cents; third year, 20 cents; fourth year, 23 cents, and the fifth year, 26 cents per hour. Free holiday transportation is granted on an ascending scale, starting with a short distance the first year and finishing in the fifth over all the Canadian Pacific Railway system, foreign continental lines and a three-quarter rate on Canadian Pacific Railway boats to and from England.

On completion of a satisfactory apprenticeship the apprentice receives a certificate and passes at once on to the current rate of pay for the trade he has learnt.

The company takes a great interest in the present system of

training, which has now been in existence for over three years, and very careful records are kept of each boy's progress and adaptability, because we expect that as a result of our training the majority of our apprentices will, before long, be very excellent material from which to select officers, and it therefore rests entirely with each boy as to what he will make of himself. You will all readily understand that with the enormous and constantly increasing mileage of the Canadian Pacific Railways, the demand for well-trained and ambitious young men is large, and our vice-president, Mr. George Bury, told the public high-school boys in his paper some time ago: "I am continually looking around for officers," and (here the schooling question crops up again), "those on the list for promotion who have not improved on their earlier defects in education have to go by the board" or, in other words, they lose the chance of getting on they otherwise would have had.

So you see I finish up where I started—to impress all you boys not to be in too great a hurry to quit school the first opportunity you get. If you have to start work early, then go to a night-school, and keep on going. You will find there is always something more to learn, whatever you may be studying or working at.

## SALESMANSHIP

A. L. STRUTHERS
Representative of the Business Science Club of Winnipeg

I am glad to look into your faces this afternoon, boys. You are to be congratulated on working in harmony with a school system which is sufficiently progressive to prepare you here and now for the work which many of you will do for the rest of your lives. A number of you will become salesmen and you are wise to lay hold of anything that will enable you to become scientific salesmen.

We are living in a scientific age, one in which all lines of useful effort are rapidly becoming reduced to a scientific basis. Salesmanship is a science because the facts of successful salesmanship have been gathered together, classified, and arranged for easy study by young men who wish to make it their life's profession. We are living in an age of the survival of the fittest. It means

more to be fit today than it did ten years ago. It will mean more to be fit ten years from now than it does today.

We shall consider some principles that will point the way to sound preparation for the work of salesmanship so that you will be "fit" for the struggle for success in business.

I shall speak this afternoon of a few ways in which a school boy can prepare himself for high-grade salesmanship while he is still at school. I say "while he is still at school," because I meet hundreds of salesmen every week who bemoan the fact that their parents allowed them to leave school too soon. These men sell quite a lot of goods, but they feel every hour of each day that they could sell so much more goods if they were better educated.

Salesmen drawing large salaries tell me that they lose big sales through not being able to write a convincing letter or on account of making some slip in their speech. Many of these salesmen tell me that they have to do business with highly educated people and they feel handicapped because their own education has been neglected. They cannot talk to a well-educated man in his own language. Then, again, some of their customers have highly trained minds and strong reasoning powers. These men seem so far above the unequipped salesman that the latter's confidence in himself is not sufficient to enable him to close deals with men of superior mentality.

To be ready for some of these conditions, I have a few suggestions to make to you, boys, this afternoon. One is, endeavor to enjoy every hour you put on such subjects as arithmetic, algebra, and Euclid, because they train your reasoning powers. They also train your power to concentrate. Every good salesman must be able to concentrate or hold his mind down to one thing for a long time. I would say, also, endeavor to enjoy the study of literature and poetry because it trains your imagination, your memory, and your power to express yourself in convincing word-pictures.

I mentioned memory just now. Many sales are lost through lack of a good memory. You have an opportunity here and now to train your memory while at school. Better practice now than have to do it when you should be busy studying your goods and studying your customers.

One other thing I must mention, and that is, to study the laws of health, so that you will not poison your bodies with the food

you eat and by the way you eat it. A great many sales are lost by good men just because they are sick through being careless in their eating. Take breathing exercises first thing every morning. Bathe your chest in cold water every single morning. Keep the muscles in splendid trim by easy exercise during several parts of the day. All this will help you make good salesmen.

Now here is one thing I want to say about what you can get here in school, so that you will not be sorry for having neglected it later on. Many salesmen close deals by being able to write good letters or good advertisements. Other salesmen lose fine sales by being ignorant of how best to state their points on paper. To avoid this condition of affairs later on, boys, make the most of the composition period, polish up your language in order to make it more forceful. To this end, study the rules of rhetoric so that you can make your language more convincing and clear. Do it now, boys, while you have the chance, and in later years you will have more time to study your goods and to study your customers. If you do what I have just advised, you will be well equipped to tackle the selling game.

Now I am going to speak of a part of salesmanship that you should pay a great deal of attention to. It is this: Sizing up customers, and then rubbing customers the right way, as it were—being tactful. To do this you should cultivate a pleasing personality. Be in earnest in everything you do. Cultivate gracefulness of walk, and when standing. Read books about great men who have these qualities. Fill your mind with such stories. Broad study will make you open-minded, which is a necessary quality of a good salesman. A narrow-minded salesman is so because he is ignorant, and you want to do everything you can now to equip yourself with knowledge, so that people will never accuse you of being narrow-minded. Such qualities as refinement, regularity, and thoroughness will enable you to get on well with different types of customers. These qualities you have the chance of developing now while mastering your studies in school. Do everything to persuade your parents to keep you in school for a number of years, in order that you may be highly equipped for rendering high-class service to your firm and its customers.

Closing a sale means the ability to get another mind to look at

the thing in your way. He must be persuaded. You can do this by a careful selection of words and sentences when at the critical point of the sale. So study this matter of language-mastery. It will help in every single move of a business deal.

Now, boys, this means a lot of effort, I know. Many men sell goods without the equipment I have spoken about, but they could sell a great deal more if they had more of such equipment. I know of one furniture salesman in the city who often sets his customers laughing at him by saying "Them's fine chairs." "That's some sofa." Many women do not like his way of talking. They have no respect for him. They lose confidence in his judgment. They do not take his advice about things, because they feel that if he is not careful in his words he will not be careful in his dealings with them. Remember, boys, women are the most numerous buyers in the world.

Some salesmen get $50.00 a month. Some earn $150.00 a month. Why? The first one sells goods, but needs a lot of correcting—supervision or oversight. The second one sells much goods and needs less correcting and overseeing. No one else is paid part of his salary to do his thinking for him. The thought may be represented with some degree of accuracy by these lines:

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| Much supervision needed | Little efficiency |
| Less supervision needed | More efficiency |
| I ittle supervision needed | Greater efficiency |
| No supervision needed | Highest possible efficiency |

These two things—needed supervision and efficiency—vary. That is, each grows less or greater as the other grows greater or less. If, then, you wish to measure the grade of your work as to quantity and quality, study carefully to find out how much supervision is really needed. And mark well: the test—the real test—is not how much it *gets*, but how much it *needs*.

### UNIVERSAL APPLICATION OF THE LAW

The law applies to everyone from the ruler of the nation down to the humblest employee. Even the ancient king in an absolute monarchy was sometimes greatly in need of supervision, although by virtue of his position there was no one to administer it directly. When that need became too great, he was sometimes removed or

even beheaded through the exercise of indirect supervisory power by his subjects.

Your opportunity for fitting yourselves for high-grade salesmanship is right here at school. Avoid envying those who are at work in business places. They have not the chance you now have. You will be able to apply all you learn here out in the whirlpool of business competition. The best equipped man wins out.

I repeat that your opportunity for obtaining the equipment is here and now.

## THE BUILDING TRADES

W. H. CARTER
President of the Carter-Hall-Allinger Co.

I represent the building business, one of the largest industries in our country, in which I am sure there are more opportunities for you, boys, than any other business. A boy that makes good in the building business finds so many different avenues open to him. A successful building superintendent can go out as superintendent or foreman on railroad construction, concrete work of all kinds, such as dams, bridge piers, etc., road building, street paving, water works, and sewer construction. Numerous jobs with big pay await the man who knows the business.

To learn the building business there are several ways, but I would advise you to finish your high-school education, then, at about 16 or 17, apprentice yourself to some contracting firm as a carpenter or bricklayer, if you feel you cannot afford a college education such as structural or civil engineering. Of course you can afford this if you try, as many of our best engineers have worked their way through college and come out quicker and with higher honors than the boy whose dad furnished the money.

While there are all the different trades connected with the building business, I suggest the bricklaying or carpenter trades, as you come in contact with all branches of the work from the foundation up, and have an opportunity of becoming familiar with all classes of construction work under more different foremen or more difficult buildings, and have a chance to talk to different mechanics, from all of which you gain your entire knowledge of the building trade.

I can say to you that all I know of the building business I have learned from close observance of the different methods employed by other contractors and from conversation with different mechanics.

However, although this is your principal source of knowledge, there are many ways for you to get help as you go along. When you start your apprenticeship, get hold of different books to read on different kinds of construction. We have a library in our office from which we loan our boys books on the trade they are learning. Take a course of architectural drawing at the Y.M.C.A. or night school, or by correspondence. This will help you to understand plans and specifications prepared by architects, and when you understand and know them and can lay out work, the one hard thing to learn is to work your men to the best advantage.

This knowledge can only be obtained by applying good horse sense and watching the other fellow when you are working under him, and ever waiting for a chance to show what you can do; and when you get that chance don't let anything prevent you from making good. If you have to disappoint social friends, miss a ball game or taking your girl to a show, go in and make good—run the work as if it were your own. When that job is done another will be waiting for you, and your career as a building superintendent is well under way. It all means hard study and hard work and large responsibilities. When you are placed in charge of work, your men's lives are protected by your judgment as to the placing and erecting of scaffolding and equipment. Your firm's reputation is up to you and their money, perhaps. One bit of poor work or of misplaced judgment in some respect might lose them much money.

Now, in serving your apprenticeship and learning a trade, you do not have to do as perhaps your father did in the Old Country—pay for a chance to learn a trade. To learn to be a bricklayer or mason, you apprentice yourself to some firm of contractors for four years. The first year you are paid $6.00 per week; the second, $12.00; the third, $18.00, and the fourth, $24.00. After the four years and your apprenticeship are completed, you make 75 cents per hour for eight hours as a journeyman, or you should be able to run a job at a salary of $40.00 to $50.00 per week. A carpenter is much the same, only the wages are not as much.

Carpenters make $5.00 a day, but they get in more days' work in a year than a bricklayer, which makes their year's pay about the same.

Now, boys, the reason I have told you all this is to show you that while you are learning a trade which will bring you a good salary always, a trade for which you will always be in demand somewhere, you are at the same time making the first year as much per week as the boy who runs messages, runs an elevator, or drives a delivery wagon—a work in which there is no possible future, except from $6.00 to $12.00 or $15.00 a week as long as you live. See the difference? One leads to a job of $50.00 a week, one to a job of $15.00; one to a position in which you do things, erect buildings to which you can point in your old days with pride, the other to just a job of long hours and small pay.

The building business or any construction work is very fascinating; you see each day something done, something new accomplished; you meet all kinds of people, travel in different lands, work out of doors, which makes you strong and healthy, and each job completed, if done well, will stand for years as a monument to your handiwork.

As I said before, the highest positions in any firm of builders are open to each of you, boys, if you are square and honest and willing to work hard and apply your whole energy to the job you are on and to your employer's interest.

You do not require a college education to become a building superintendent, although no boy should miss the opportunity of getting a college education if it is within his reach.

The pay of a building superintendent depends entirely on his ability to do work quicker and cheaper with the same number of men than the other fellow. We have superintendents in our employ making from $30.00 to $60.00 per week. The $60.00-a-week man is a fellow who has applied himself closely to his business, knows all the quick ways of doing things, is capable of handling men to good advantage, looks after his work day and night if required, and goes out with one aim in view—to erect the building he is sent out on quicker and cheaper than any other man can. That is what you want to be, and you have perhaps a better opportunity to succeed than some of the men with us.

We have about thirty superintendents and foremen and several under-foremen in our employ, and about 1,500 workmen during the busy season. Most all of our superintendents or foremen have been promoted from the ranks. If we want a brick foreman, I go to the superintendent on some job and ask if he has a bricklayer on the job who would make a good foreman. If he has a man who seems interested in his work and wants to get ahead, we give him a trial. If he makes good, he possibly goes on up to general superintendent. The same with a carpenter foreman or any other trade. We have a good superintendent who started as water-boy, went up as labor foreman, who is now making $40.00 to $50.00 per week. Some started as timekeepers. That is a good way, as you can get a good knowledge of the business or bookkeeping side as well as the practical side.

That is the way I started in the building business. About sixteen years ago I was keeping time and checking material under construction at $5.00 per week. I soon became assistant to the general superintendent and in a short while was placed in charge of some small work. I worked hard, made good, and they gave me a larger job, and so on, always on the job and working for the interest of the firm I was with, until I went into the company I am a part of today.

Now, boys, I could tell you a lot about the building game that would interest you if I were more used to talking to you or acting in this position, as it is an interesting business. I could tell you of men I know in some of the larger cities who are recognized as the best men in the business, men who carry out large undertakings, build twenty- and forty-story buildings, and things like that—men who are making a success of the business financially, and not one of these men had any special training or any special opportunities that are not open to you in Winnipeg today.

Boys, every opportunity to become great in any business or profession is offered you in Winnipeg today; it is up to you to make good, and I hope that some of you boys here this afternoon will be strong factors in the building business in the years to come, and any time I can be of any service to you in the way of advice or information I trust you will come to see me. Come to my office or my home any time.

# PATTERN-MAKING

E. STEWART
Mechanical Superintendent Manitoba Bridge and Iron Works, Ltd., Winnipeg

We are now living in the age of extreme specialization of trades and industries, consequently the older and more typical handicrafts are rapidly being broken up.

Fifty or sixty years ago, the old race of millwrights were "all-round" men in the engineering firms. They could fit up a mill throughout, design its arrangements, make the patterns, weld a shaft, forge levers, fit up the bearings, turn and bore the wheels, line the shafting, and, in fact do all the work that is now divided among half a dozen separate and distinct trades. Necessarily they were not so skilful in any one branch as the individual tradesman of today, but they were better craftsmen, because more complete than the mechanics who now do one thing and one thing only. This race of craftsmen, except in some isolated localities, has nearly died out.

Now the pattern-maker constructs the wooden models; the fitter chips, files, and fastens the different parts together; the planer, slotter, and shaper save the fitter's muscles; and the iron-turner prepares the shafts and bores the wheels. The fitter and erector occupy distinct positions, while each individual workman usually excels only in some special branch of work.

But this division of labor has its advantages. Machinery has been cheapened; there is more beauty and finish about it; and it is capable of being turned out much more rapidly than was possible under the old style.

Let us now consider for a few moments the subject of this paper, "The Art and Trade of Pattern-Making." I need not waste valuable time describing to you the various tools required by a pattern-maker, nor yet the various uses they are put to, as I am well aware you receive valuable instruction along that line at the manual classes in connection with the schools. There is only one tool which I cannot overlook, as it is most necessary in pattern-making, viz., the contraction rule. Now the contraction rule, as the name implies, is a rule which is made longer than the standard rule by the amount which metals contract in cooling from the molten state

to the ordinary temperature of the atmosphere. Though a standard rule is required for the measurement of castings, it would be obviously inconvenient to use it in pattern-making, because the workman would be perpetually making approximate allowance for contraction in fractional parts of a foot. So the contraction rule economizes his time and insures something more accurate than approximations.

A two-foot contraction rule for cast iron is $\frac{1}{4}$ inch longer than the standard rule, $\frac{1}{8}$ inch in two feet for steel, $\frac{1}{8}$ inch in ten inches for brass, and so on. Of course this contraction varies in accordance with style and weight of article being made, and the proper allowance can only be learned by careful study and years of practice.

Next we come to the timber used for patterns. Yellow pine is the most extensively used timber for large patterns. It is light, soft, easy to work, comparatively free from liability to warp and twist, and it is cheap. Of course it must be perfectly dry, as wet lumber is useless for patterns, because the pattern would warp and shrink out of shape when drying. For small patterns mahogany is the best timber. It is hard, strong, and not liable to warp. Its price, however, precludes its use except for small patterns or standard patterns which have to be molded repeatedly. Other woods are sometimes used, but these are the best and are the ones most commonly used.

To fully explain the various methods of constructing patterns would incur much labor and occupy many volumes, so I will content myself at present by explaining to you what a pattern really is. A pattern is a duplicate of the article required, but made larger than the casting by the amount of contraction which that metal will have when cooling. It must also have allowance made for machining where required, and be so constructed that it can be withdrawn from the sand. It must also be so constructed as to make the pattern as strong as possible and least likely to warp. I have here a pattern of a sheave wheel. You will notice that it is split through the center of the groove; this is necessary in order to withdraw the pattern from the sand. The pattern is first placed on a straight board, bottom side upward, and a suitable box placed around it. This box is then filled up with sand and rammed up. The whole is then rolled over and the sand dug out to the bottom

edge of the groove, and a tapering ring put in position. This ring is then rammed with sand and a parting made to the upper edge of the groove. Next, the top half of the box is placed in position and rammed with sand, provision having been made for the running metal. The top box is then lifted off, one-half of the pattern withdrawn, next the ring is withdrawn and then the other half of the pattern. The ring is then replaced and the top half of the box put on, clamps are then put in position to hold the top and bottom boxes together and the mold is ready for receiving the metal. The drawing on the board will fully explain what I mean. This is an example of a sheave with a solid web, but sheaves of a larger size are very often made with arms, the construction of which the models before you will explain. Time will not permit of my explaining the construction of any other style of pattern at present, but I have with me several examples which I shall be only too pleased to explain to any of the boys interested at the end of the lecture.

We will now dwell for a little time on the "Qualifications of a Pattern-Maker."

Now I am not going to frighten any of you boys who have the ambition of becoming a first-class craftsman, whether it be pattern-making, molding, engineering, or a trade of any description, or a profession of any kind, by laying down to you a long list of studies. Book knowledge is indeed not really necessary, for many a first-class workman has been comparatively illiterate; but then such a man is generally incapable of ever becoming anything more than a mere man at the bench. Now I am sure very few of the boys before me wish to drudge along day by day, year by year, content with a mere journeyman's wages. Now is the time to start and expand the mental horizon. Spend your spare moments in enjoying the pleasures of literature and in gaining an insight into the marvels of the Wonderland of Science, instead of idling away the most valuable time of your life on the streets or in the pool rooms. Everyone cannot reach the top of the ladder; everyone will be appreciated who has learned the fundamental reasons of things and so can proceed intelligently at his task. Even when working at the bench no man knows when he may be thrown upon his own resources. There

is many a shop where there is no foreman kept to instruct you, so the man who can cope with emergencies as they arise and can do his job quickly and substantially without assistance generally finds employment as long as he cares to keep it.

There is no use to think of becoming a good pattern-maker without becoming also, to some extent, a good engineer. If you are ill-informed in the principles of design you will hesitate how to proceed with a new piece of work, or whether to proceed with it at all without consulting the foreman or superintendent. It is therefore necessary to have a knowledge of the elements of geometry or mensuration; with that knowledge you can mark out and cut away your stuff at once without working slowly and doubtfully in the dark.

A knowledge of drawing is one of the chief requirements of the pattern-maker. By drawing I mean the principle of projection as applied to geometric figures in plane, elevations, sections at various angles, and so forth. The mere copying of mechanical drawings is of little or no value, but the student that has thoroughly mastered the principles of projection will never experience any serious difficulty either in making or in understanding an intricate drawing. You should also be proficient in arithmetic; by that I mean the elementary rules, together with proportion, decimals, and the evolution of the square and cube roots.

Lastly, there is that experience which in the course of time bears the semblance of intuition—that experience which comes of close and long-continued observation and which is invaluable to its possessor. So, boys, I would advise you to be always on the lookout for something new. Study well everything you see; you will learn much more in this way than by many book studies.

Pattern-making is a trade which I would recommend to any boy who is energetic. You will always find it most interesting, for it is one of the very few trades where such a variety of work can be got. To any who wish to become pattern-makers or tradesmen of any kind, I can only say, be industrious, study hard while at school, stay at school as long as possible. Nothing will be gained by leaving school too early, as what you are learning now will be forgotten before you start work if you run around the streets for a few years.

[*To be continued*]